

**ABSTRACT**

A system is provided for measuring transmission characteristics of a gas of interest through a barrier material wherein a sealed test gas chamber is provided on one side of the barrier material and an aligned sealed measurement chamber is provided on the opposite side of the barrier material. A rough vacuum is pulled in the test gas chamber and a high vacuum pulled in the measurement chamber to establish a set pressure differential therebetween. A mass spectrometer having partial gas sensitivities of  $5 \times 10^{-4}$  Torr or lower in fluid communication with the measurement chamber determines permeation of the test gas of interest through the barrier material.

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